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U.S. ARMY MILITARY DISTRICT OF WASHINGTON
FORT LESLEY J. McNAIR, DC 20319-5058

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Safety
ERGONOMICS


FOR THE COMMANDER:

STEPHEN B. MASSEY
Colonel, GS
Chief of Staff

DISTRIBUTION:

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C

OFFICIAL:


JOYCE HENDERSON
LTC, AG
Adjutant General

History. This is a new regulation.

Summary. This regulation prescribes policy, procedures, and responsibilities for the establishment of an ergonomics program for the U.S. Army Military District of Washington (MDW).

Applicability. This regulation applies to staff principals, installations, and subordinate commands and activities of MDW. It also applies to tenant activities that are assigned to or supported by MDW.

Supplementation. This regulation may be supplemented at the installation level. Proposed supplements must be submitted for approval to Commander, MDW, ATTN: ANOS, 103 Third Avenue, Fort Lesley J. McNair, DC 20319-5058.

Suggested improvements. The proponent of this regulation is the MDW Safety Office. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, MDW, ATTN: ANOS, 103 Third Avenue, Fort Lesley J. McNair, DC 20319-5058.

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Chapter 1

Introduction

1-1. Purpose

This regulation provides guidance for establishing an ergonomics program as an integral part of the MDW safety and occupational health (SOH) program and prescribes policies, procedures, and responsibilities to protect employees from work-related musculoskeletal disorder(s) (WMSD).

1-2. References

Required and related publications and referenced forms are listed in appendix A.

1-3. Explanation of abbreviations and terms

Abbreviations and terms used in this regulation are explained in the glossary.

1-4. Occupational risk factors

a. Various research has identified the following as specific workplace conditions that can contribute to the development of WMSDs:

- (1) Repetitive motions (especially during prolonged activities).
- (2) Sustained or awkward postures.
- (3) Excessive bending or twisting of the wrist.
- (4) Continued elbow or shoulder elevation (e.g., overhead work).
- (5) Forceful exertions (especially in an awkward posture).
- (6) Excessive use of small muscle groups (e.g., pinch grip).
- (7) Acceleration and velocity of dynamic motions.
- (8) Vibration.

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- (9) Mechanical compression.
- (10) Restrictive workstations (e.g., inadequate clearances).
- (11) Improper seating or support.
- (12) Inappropriate hand tools.
- (13) Machine-pacing and production-based incentives.
- (14) Extreme temperatures.
- (15) Extended exposure to hazardous or annoying noise.

b. The combined effect of several risk factors in one job or workstation may lead to a higher probability of causing a WMSD.

1-5. Effects of work-related musculoskeletal disorders

a. Health effects. Repeated biomechanical stress and microtrauma cause or aggravate WMSDs. Over time, repeated microtrauma can evolve into a painful, debilitating state involving muscles, tendons, tendon sheaths, and nerves. Examples of WMSDs are:

- (1) Tendinitis.
- (2) Tenosynovitis.
- (3) Bursitis.
- (4) Chronic muscle strain.
- (5) Nerve entrapment syndromes (e.g., carpal tunnel syndrome).

b. Economic effects. The expense associated with a poorly designed workplace is considerable and includes both direct and indirect costs.

- (1) Direct costs include medical treatment, rehabilitation, and workers' compensation costs.
- (2) Indirect costs include lost work time, decreased productivity, decreased work quality, retraining costs, and diminished morale.

1-6. Goals

The goals of the ergonomics program are to:

- a. Prevent injuries and illness by eliminating or reducing worker exposure to WMSD risk factors.
- b. Reduce the potential for fatigue, error, and unsafe acts by adapting the job and workplace to the worker's capabilities and limitations.
- c. Increase the overall productivity of the work force.
- d. Reduce workers' compensation claims and associated costs.
- e. Improve overall unit readiness.

1-7. Organizational involvement

Command emphasis, commitment by management, and demonstrated visible involvement are imperative to provide the organizational resources and motivation needed to implement a sound ergonomic program. Everyone is responsible for injury prevention and the identification and resolution of WMSDs.

1-8. Technical assistance

Technical assistance may be requested through command channels to Commander, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), ATTN: MCHB-DC-OER, Aberdeen Proving Ground, MD 21010-5422, telephone DSN 584-3928, commercial 1-410-671-3928, or 1-800-222-9698.

Chapter 2

Responsibilities

2-1. MDW Safety and Occupational Health (SOH) Director. The MDW SOH Director will provide overall policy guidance, coordination, and oversight of the ergonomics program.

2-2. Garrison commanders. Garrison commanders will--

a. Designate an installation ergonomics officer (IEO).

b. Establish an ergonomics subcommittee under the safety and occupational health (SOH) advisory council and integrate ergonomics into all phases of the installation SOH program.

c. Approve the installation ergonomics plan based on the recommendations of the SOH advisory council.

d. Provide sufficient funds and other resources to carry out all responsibilities related to the ergonomics program.

e. Work with installation personnel, unions, and appropriate Regulatory authorities to effectively address ergonomics issues.

f. Require that appropriate reporting and recordkeeping procedures be followed.

g. Demonstrate commitment to the ergonomics program.

2-3. Installation SOH managers. Installation SOH managers will--

a. Obtain and have available for review the following to the IEO:

(1) Log of Federal Occupational Injuries and Illnesses or equivalent.

(2) Federal Employee Compensation Act (FECA) claims.

(3) DA Form 285 (U.S. Army Accident Report (RCS CSOCS-308)), and DA Form 285-AB-R (U.S. Army Abbreviated Ground Accident Report (AGAR) (RCS CSOCS-308)).

(4) Safety records.

b. Provide reports to the installation command group.

c. Advise the commander on issues related to SOH including ergonomics.

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2-4. Supporting installation medical authority (IMA).
Supporting IMA will--

a. Be responsible to the commander for all medical aspects of the SOH program.

b. Advise the installation SOH manager on appropriate individuals for membership on the ergonomics subcommittee.

c. Ensure a written installation protocol is developed for the early recognition, evaluation, treatment, and follow-up of WMSDs among military and civilian personnel.

2-5. Installation ergonomics officer. Installation ergonomics officer will--

a. Be a qualified health or safety professional who has received at least 40 hours of formal ergonomics training.

b. Advise the installation SOH manager on appropriate individuals for membership on the ergonomics subcommittee.

c. Chair the ergonomics subcommittee and provide an interface between the ergonomics subcommittee, the installation Federal Employee Compensation Act (FECA) working group, and SOH advisory council.

d. Develop and implement an installation ergonomics plan with the assistance of the ergonomics subcommittee, FECA working group, and approval of the SOH advisory council.

e. Oversee, manage, or actually perform worksite analysis and ensure its completion.

f. Ensure that an internal evaluation and review of program objectives are conducted and the results are reported to the SOH advisory council with the assistance of the ergonomics subcommittee.

g. Ensure accurate recordkeeping of ergonomics subcommittee reports.

2-6. The ergonomics subcommittee. The ergonomics subcommittee will--

a. Include, but need not be limited to the following representatives:

- (1) Core membership.

(a) Health care personnel (for example, physician, nurse, occupational and physical therapists, physician assistant, and other trained medical personnel).

(b) Industrial hygienist.

(c) Safety professional.

(d) Union(s).

(e) Civilian personnel professional.

(2) Support and advisory membership.

(a) Contracting specialist.

(b) Logistical personnel.

(c) Engineers and maintenance personnel.

b. Receive appropriate ergonomics training as discussed in chapter 5.

c. Under the chair of the IEO and in conjunction with the installation FECA working group, assist in developing and implementing the installation ergonomics plan.

d. Oversee and participate in:

(1) Gathering and evaluating injury, lost work time, trend, productivity, and complaint data on worksites and work processes.

(2) Identifying existing and potential WMSDs.

(3) Conducting worksite evaluations.

(4) Setting priorities for abatement of identified WMSDs.

(5) Implementing corrective actions.

(6) Providing appropriate worker training.

e. Develop methods to evaluate the effectiveness of the corrective actions and document the results.

f. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.

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g. Provide reports to the installation SOH advisory council at least semiannually.

2-7. Industrial hygiene (IH) personnel. The IH personnel will--

a. Serve on the installation ergonomics subcommittee.

b. Consider WMSDs during routine worksite evaluations.

c. Perform or assist in performing in-depth ergonomic assessments as needed.

d. Assist in solving problems related to identified WMSDs.

e. Keep accurate records of identified WMSDs and high-risk work areas and solutions. Provide these records to the ergonomics subcommittee for review and tracking. The records will be stored in the Health Hazard Information Module (HHIM) once this function is available in the software.

f. Provide ergonomics training and education for military and civilian personnel. Persons tasked to provide training should obtain refresher ergonomics training to maintain expertise.

g. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.

2-8. Installation safety personnel. The installation safety personnel will--

a. Serve on the installation ergonomics subcommittee.

b. Oversee the safety aspects of the ergonomics program.

c. Coordinate the annual standard Army SOH inspection with occupational health program personnel, and consider WMSDs during the inspection.

d. Maintain appropriate records, such as the Log of Federal Occupational Injuries and Illnesses.

e. Review injury and illness records related to WMSDs, develop trend analyses, and report results to the ergonomics subcommittee.

f. Assist with ergonomics training and education. Persons tasked to provide training should obtain refresher ergonomics training to maintain expertise.

g. Perform or assist in performing in-depth ergonomic assessments as needed.

h. Assist in solving problems related to identified WMSDs.

i. Keep accurate records of identified WMSDs and high-risk work areas and solutions. Provide these records to the ergonomics subcommittee for review and tracking. The records will be stored in the HHIM once this function is available in the software.

j. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.

2-9. Health care personnel. The health care personnel will--

a. Serve on the installation ergonomics subcommittee. A representative from specific health care areas (for example, physician, nurse, occupational and physical therapists, physician assistant) will serve on the ergonomics subcommittee.

b. Develop a written installation protocol for the early recognition, evaluation, treatment, and follow-up of WMSDs between military and civilian personnel.

c. Develop and conduct baseline medical screening for new personnel whose positions have specific medical standards, physical requirements, or are covered by a medical evaluation program established under applicable Regulations (5 CFR 339.301).

d. Assist trained ergonomics personnel in the identification of modified or restricted-duty jobs.

e. Make specific recommendations to the Civilian Personnel Advisory Center (CPAC) or unit on the assignment of injured workers to modified or restricted-duty jobs.

f. Assist in ergonomics training and education.

2-10. Civilian personnel advisory center (CPAC). The CPAC will--

a. Ensure newly appointed supervisors, managers, and personnel are made aware of the benefits and responsibilities provided by AR 690-800, chapter 810, subchapter 6.

b. Maintain the case file data on lost duty time as a result of injury or illness and provide this information for review by the ergonomics subcommittee.

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c. Appoint at least one representative to serve on the ergonomics subcommittee. This should be the FECA coordinator or other appropriate personnel.

2-11. Contracting support personnel or equivalent. Contracting support personnel or equivalent will--

a. Ensure the integration of ergonomic considerations into the purchase of new equipment.

b. Implement recommendations from trained ergonomics personnel to reduce WMSD risk factors when feasible.

c. Appoint an advisory or support representative to serve on the ergonomics subcommittee.

2-12. Department of Public Works personnel. The Department of Public Works personnel will--

a. Integrate ergonomic considerations into facility modifications and construction.

b. Implement recommendations from trained ergonomics personnel to reduce WMSD risk factors when feasible.

c. Appoint an advisory or support representative to serve on the ergonomics subcommittee.

d. Ensure engineers and maintenance personnel:

(1) Prevent and correct WMSDs through job and workstation design and proper maintenance.

(2) Apply ergonomic concepts both in general and in regard to the specific conditions of the facility.

2-13. Logistical personnel. The logistical personnel will--

a. Ensure the integration of ergonomic considerations into the purchase of new equipment.

b. Implement recommendations from trained ergonomics personnel to reduce WMSD risk factors when feasible.

c. Consult with trained ergonomics personnel to assist in the evaluation of equipment and furniture for ergonomic design.

d. Appoint an advisory or support representative to serve on the ergonomics subcommittee.

2-14. Union representatives. The union representatives will--

a. Serve as members of the ergonomics subcommittee. All unions at the installation should be offered the opportunity to appoint an advisory or support member to the ergonomics subcommittee.

b. Ensure that key personnel recognize and report WMSDs.

2-15. Supervisors. The supervisors will--

a. Ensure personnel are trained and

(1) Follow safe work practices.

(2) Recognize, correct, and report hazardous work practices.

(3) Recognize and report early symptoms of potential WMSDs.

b. Routinely review work areas, tasks, and tools for potential WMSD risk factors.

c. Coordinate with trained ergonomics, safety, and health personnel to reduce risks and support the overall ergonomics program.

d. Maintain effective schedules for facility, equipment, tool maintenance, adjustments, and modifications.

e. Hold personnel accountable for failure to follow safe work practices and recognize initiatives in improving operating conditions and procedures through incentive awards.

f. Ensure personnel are aware of benefits and responsibilities provided by AR 690-800, chapter 810, subchapter 6.

2-16. Military and civilian personnel. The military and civilian personnel will--

a. Modify work practices as recommended.

b. Notify supervisors of WMSD risk factors in the workplace.

c. Recognize and report symptoms of WMSDs early.

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- d. Participate in medical surveillance programs.
- e. Perform recommended conditioning activities.
- f. Actively participate in the suggestion process.
- g. Routinely review work areas, tasks, and tools for potential WMSD risk factors.

2-17. Trained ergonomics personnel. These are personnel who have met the minimum standards as specified in the glossary. They will--

- a. Serve on the installation ergonomics subcommittee.
- b. Assist with the identification and control of WMSDs (alone or as members of the ergonomics subcommittee).
- c. Perform in-depth ergonomic assessments of identified problematic work areas, tasks, and tools to determine WMSD risk factors.
- d. Document all evaluations, recommendations, and actions related to ergonomics and the effectiveness of the actions.
- e. Provide ergonomics training and education for military and civilian personnel. Personnel tasked to provide training should obtain refresher ergonomics training to maintain expertise.
- f. Work with medical personnel in the identification of potential WMSDs and advise medical personnel on ergonomic changes related to the workstation, tasks, and tools.
- g. Participate in the ergonomics subcommittee's semiannual ergonomics program evaluation and review. An internal evaluation and review, performed quarterly, is recommended.
- h. Keep accurate records of identified WMSDs and high-risk work areas and solutions. Provide these records to the ergonomics subcommittee for review and tracking. The records will be stored in the HHIM once this function is available in the software.

Chapter 3

The Installation Ergonomics Plan

3-1. Focus

The installation ergonomics plan focuses on the identification and control of improper workplace and work process design to protect personnel from injury and illness due to exposure to occupational risk factors.

3-2. Development and approval

a. The IEO and the ergonomics subcommittee develop, document, and maintain the installation ergonomics plan. They may:

(1) Solicit input to the plan from health care providers including physicians, nurses, occupational therapists, physical therapists, and physician assistants.

(2) Integrate the plan with the installation or activity health promotion and wellness program coordinator as appropriate.

(3) Request technical assistance on plan development from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), chapter 1, subparagraph 1-8.

b. The installation SOH advisory council, in conjunction with the installation FECA working group, recommends the installation ergonomics plan to the commander for approval and communicates the plan to all managers, supervisors, and workplace personnel.

3-3. Outline

The installation ergonomics plan should reflect the needs and requirements of the individual installation. At a minimum, the ergonomics plan will contain the items listed below.

a. Program goals and objectives.

b. Program interface with existing programs.

c. Specific critical program elements for ergonomic intervention:

(1) Worksite analysis (app B).

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- (2) Hazard prevention and control (app C).
- (3) Health care management (app D).
- (4) Ergonomics program evaluation (chap 4).
- (5) Education and training (chap 5).

Chapter 4 Ergonomics Program Evaluation

4-1. Evaluation requirements

Both external and internal sources will evaluate each installation's ergonomics program to assess program effectiveness.

a. External evaluations

(1) Authorized Occupational Safety and Health Administration inspections may result in citations to the activity commander for ergonomic deficiencies identified in the workplace.

(2) Ergonomics Program personnel at USACHPPM, on request from the installation, may:

- (a) Conduct installation ergonomics surveys.
- (b) Evaluate elements of the ergonomics program.
- (c) Assist with ergonomics program development.

(3) The MDW Safety Office will evaluate the installation's ergonomic program during staff assistance visits.

b. Internal evaluations. The IEO will ensure evaluation of the ergonomics effort Regarding program participation and effectiveness. Methods of measuring both of these elements are listed below.

(1) Program participation.

(a) Number of requests for ergonomic assistance by management occurring during a specified period.

(b) Number of personnel suggestions related to ergonomics during a specified period.

(c) Number of educational programs in ergonomics offered or number of personnel attending educational programs.

(2) Program effectiveness.

(a) Number of general or systematic identifications of potential WMSDs.

(b) Number of detailed analyses conducted.

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(c) Number of high priority listings relating to ergonomics.

(d) Change in the incidence rate (see glossary) of ergonomically related FECA claims or dollar amount of new FECA claims within a particular period.

(e) Change in the incidence rate of ergonomically related illness or injury reports filed for military and civilian personnel.

(f) Change in the incidence rate of ergonomically related illness or injury by department or unit.

(g) Change in the incidence rate of lost or restricted-duty time due to ergonomically related illness or injury.

(h) Change in the number of new job reassignments due to ergonomically related illness or injury.

(i) Change in productivity or production costs that can be attributed to ergonomic interventions.

Note: In some cases, there may be an increase in illness or injury reporting at the start of an ergonomics program due to increased personnel and supervisor awareness. This reporting rate will decrease as a well-managed, effective ergonomics program is integrated into the workplace.

4-2. Regular evaluation and review

a. The IEO and the ergonomics subcommittee will--

(1) Conduct at least a semiannual program evaluation and review.

(2) Present the results of this program evaluation and review to the installation SOH advisory council.

(3) Communicate the results of the program evaluation and review to top management and all workplace personnel.

b. The program evaluation assesses the implementation, progress, and effectiveness of the installation ergonomics plan. It should include:

(1) A summary progress report or program update.

(2) A summary of results of any external evaluations.

(3) Plans, goals, and accomplishments for the program as a whole and by the critical program elements.

(4) Identification of trends, deficiencies, and corrective actions needed.

(5) New or revised program goals, priorities, and time lines.

c. Use the following information to develop the evaluation and review.

(1) Analysis of trends in injury or illness rates according to:

(a) Health care facility sign-in logs.

(b) Log of Federal Occupational Injuries and Illnesses or an equivalent log.

(c) Individual personnel medical records.

(d) The Defense Occupational Health Readiness System (for example, HHIM).

(2) Review of results of installation evaluations.

(3) Before and after surveys or evaluations of worksite improvements.

(4) Observation of work practices to determine the effect of training and education.

(5) Personnel surveys or interviews conducted by department, job title, or work area to monitor trends.

Chapter 5

Education and Training

5-1. Education requirements

a. The IEO will have:

(1) A minimum of 40 hours of formal ergonomics training. Formal training is classroom instruction, exercises, supervised worksite assessment, and individual learning assignments.

(2) Training and experience sufficient to identify WMSDs and risk factors.

b. Trained ergonomics personnel will have:

(1) A minimum of 40 hours of formal ergonomics training.

(2) Training and experience sufficient to identify WMSDs and risk factors.

c. Core ergonomics subcommittee members, support and advisory ergonomics subcommittee members, and installation-level personnel providing assistance in recognizing WMSDs will have the minimum time required for the basic ergonomics training from trained ergonomics personnel.

d. For information on available in-depth courses, request assistance through command channels to the Commander, USACHPPM, ATTN: MCHB-DC-OER, Aberdeen Proving Ground, MD 21010-5422. The U.S. Army Safety Center (USASC) also offers information and training. To request assistance from USASC, contact Commander, USASC, ATTN: CSSC-PT, Building 4905, 2901 5th Avenue, Fort Rucker, AL 36362-5363.

5-2. Training requirements

a. Personnel requiring training.

(1) All Department of the Army (DA) personnel who are potentially exposed to WMSDs.

(2) Supervisors.

(3) Managers.

(4) Engineers and maintenance personnel.

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(5) Installation SOH personnel.

b. Personnel who may conduct training.

(1) Trained ergonomics personnel.

(2) Suitable health care personnel to conduct specific portions of training, such as those related to health risks.

c. Curriculum considerations. Trained ergonomics personnel will--

(1) Present training at a level appropriate to ensure audience comprehension.

(2) Include in the training curriculum an overview of--

(a) The potential risk of WMSDs.

(b) The possible causes and symptoms.

(c) How to recognize and report symptoms.

(d) The means of prevention.

(e) The sources of treatment.

(3) Include methods for evaluating the effectiveness of the ergonomics effort, as discussed in chapter 4.

d. Types of training.

(1) General training. Personnel who are potentially exposed to WMSDs will receive formal instruction on hazards associated with their jobs and equipment. Personnel will receive training at an initial orientation and annually thereafter.

(2) Specific training. New and reassigned military and civilian personnel who are potentially exposed to WMSDs will receive an initial orientation and hands-on training from trained ergonomics personnel and the immediate supervisor prior to being placed in a full-production position. The initial orientation will include:

(a) A demonstration of the proper use and care of, and the proper operating procedures for the tools and equipment used in that workplace.

(b) Use of safety equipment.

(c) Use of safe and proper work procedures, such as proper lifting techniques.

5-3. The "train the trainer" concept

Administer training programs in a pyramid fashion.

a. Ergonomics experts provide training to develop trained ergonomics personnel.

b. Trained ergonomics personnel will--

(1) Train others at the installation level, including supervisors and workers.

(2) Also train special assistants, who can help with recognizing WMSDs. The special assistants may be representatives from each department or division who assist other department members in recognizing and reporting WMSDs.

Appendix A References

Section I Required Publications

AR 40-5	Preventive Medicine
AR 385-10	The Army Safety Program
AR 385-40	Accident Reporting and Records
AR 690-800	Insurance and Annuities

Section II Related Publications

AR 40-10	Health Hazard Assessment Program
AR 602-2	Manpower and Personnel Integration (MANPRINT) in the Materiel Acquisition Process
DODI 6055.1	(Draft) DOD Occupational Safety and Health Program
EO 12196	Occupational Safety and Health Programs for Federal Employees
PL 91-596	Occupational Safety and Health Act of 1970, as amended (29 USC 651, <u>et seq.</u> (1976))
TB MED 503	The Army Industrial Hygiene Program
5 CFR 339.301	Authority to require an examination. (Available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

Section III Referenced Forms

DA Form 285	U.S. Army Accident Report
DA Form 285-AB-R	U.S. Army Abbreviated Ground Accident Report (AGAR)
DA Form 3075	Occupational Health Daily Log
DA Form 3076	Army Occupational Health Report

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DOL Form CA-2	Notice of Occupational Disease and Claim for Compensation
DOL Form CA-16	Authorization for Examination and/or Treatment
DOL Form CA-17	Duty Status Report
SF 600	Chronological Record of Medical Care
OSHA Log 200	Log of Federal Occupational Injuries and Illnesses

Appendix B Worksite Analysis

B-1. Problem identification

Use the following procedures of systematic passive and active surveillance to identify jobs or worksites with WMSD risk factors.

a. Systematic passive surveillance. This procedure involves the analysis of data provided in existing monthly or quarterly reports. This analysis can identify WMSD problems, set intervention priorities, and organize the ergonomics effort. The office responsible for maintaining the records, logs, or reports will perform the systematic passive surveillance and communicate the results to the IEO and the ergonomics subcommittee. Sources of data include:

(1) Routine injury and illness reports, including DA Form 3076 (Army Occupational Health Report).

(2) Log of Federal Occupational Injuries and Illnesses or equivalent.

(3) FECA claims.

(4) DA Form 285 (U.S. Army Accident Report) and DA Form 285-AB-R (U.S. Army Abbreviated Ground Accident Report).

(5) Medical and safety records.

(6) Work force reports (including civilian and active-duty personnel and pay reports of lost duty time as a result of injury or illness) and suggestions.

b. Systematic active surveillance. This procedure involves focused and active efforts to gather information about WMSD hazards at worksites and to identify workers at risk of developing a cumulative trauma disorder (CTD). Trained ergonomics personnel (see glossary) will perform active surveillance in conjunction with IH or safety surveys or Regular training.

(1) Examples of active surveillance procedures include:

(a) Questionnaires and surveys. Supervisor and worker questionnaires and symptom or body part discomfort surveys provide information about WMSD hazards, often before actual

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injuries occur (USACHPPM Technical Guide (TG) 220). Trained ergonomics personnel can administer these surveys during walk-through surveys or as part of regular training.

(b) Observation. Direct observation by trained ergonomics personnel conducting regular walk-through IH or safety surveys can identify WMSD hazards (USACHPPM TG 220). Worker interviews during these surveys can identify tasks or situations that are uncomfortable and may indicate WMSD risk factors.

(c) Sentinel event or incident reporting. Specific health or performance events, such as wrist pain, back pain, or increased errors, may be indicative of WMSD risk factors. Use a specific reporting procedure to facilitate reports.

(d) Case referrals. Use case referrals to identify a work area with potential WMSD risk factors. For example, a laboratory technician seeks medical care for hand and wrist pain and provides an occupational history that indicates possible worksite risk factors.

(2) The presence of one WMSD should trigger an active surveillance survey using appropriate questionnaires or surveys (USACHPPM TG 220). Trained ergonomics personnel will perform systematic active surveillance at all worksites at least once per year. Also, trained ergonomics personnel will perform walk-through surveys for any new or significantly changed job, process, equipment, or method.

(3) In many cases, corrections to the WMSD hazards or risk factors are simple, quick, on-the-spot workplace changes. Trained ergonomics personnel conducting Regular walk-through surveys can identify and implement the solution immediately. Chapter 5 provides information on hazard prevention and control. More complex problems will require prioritization and detailed analysis.

(4) If a worksite or job is identified as high risk, special medical surveillance may be indicated. Appendix D provides information on health care management.

B-2. Prioritization

The ergonomics subcommittee or the appropriate subcommittee member (e.g., IH, safety, health care, etc.) will prioritize worksites for detailed analysis based on the passive and active surveillance information. The prioritization may be based on incidence rates (see glossary), the number of workers affected, direct costs, lost work time, or severity of cases. Calculate incidence and prevalence rate by unit, work section, or job

series to identify high-risk areas. Use FECA claims information to identify high-cost injuries and high-risk work areas.

B-3. Detailed analysis

a. To further evaluate those jobs or worksites having WMSD risk factors as determined by passive and active surveillance, complete a more detailed analysis. When conducting the detailed analysis, trained ergonomics personnel should systematically:

(1) Consider the concept of multiple causation (see glossary) and the degree of WMSD risk.

(2) Look for trends, including age, gender, work task, and time of injury.

(3) Identify the work tasks or portions of the process that contain risk factors.

(4) Identify both problems and solutions.

b. The following data, analysis tools, and methods may be helpful during a detailed analysis:

(1) Incidence rates (Log of Federal Occupational Injuries and Illnesses or equivalent), accident and injury reports, and lost work time or absenteeism reports by job, unit, department, or facility.

(2) Checklists, questionnaires, and interviews (USACHPPM TG 220).

(3) Direct observation, videotape analysis, and job analyses (USACHPPM TG 220).

(4) Tests, such as:

(a) Revised National Institute for Occupational Safety and Health Equation for the Design and Evaluation of Manual Lifting Tasks.

(b) Static and dynamic strength testing.

(c) Timed activity analysis.

(d) Biomechanical analysis.

(e) Cardiovascular measurements.

Appendix C

Hazard Prevention and Control

C-1. Intervention hierarchy

The primary method of preventing and controlling exposure to WMSD hazards is through effective design (or redesign) of a job or worksite. The following paragraphs define intervention methods in order of priority.

C-2. Process elimination

Elimination of the demanding process essentially eradicates the WMSD hazard. For example, eliminate the use of the hand-held bar code scanner for logistics/inventory management personnel by providing an automatic bar code scanner.

C-3. Engineering controls

Ergonomic engineering controls redesign the equipment or worksite to fit the limitations and capabilities of workers. Equipment or worksite redesign typically offers a permanent solution (e.g., provide a video display terminal workstation that can be adjusted to a wide range of anthropometric dimensions).

C-4. Substitution

Substituting a new work process or tool (without WMSD hazards) for a work process with identified WMSD hazards can effectively eliminate the hazard. For example, replace hand tools that require awkward wrist positions (extreme wrist flexion, extension, or deviation) with tools that allow a neutral wrist posture.

C-5. Work practices

Practices that decrease worker exposure to WMSD risk factors include changing work techniques, providing personnel conditioning programs, and Regularly monitoring work practices. Also included are maintenance, adjustment, and modification of equipment and tools as needed.

a. Proper work techniques include methods that encourage:

- (1) Correct posture.
- (2) Use of proper body mechanics.

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(3) Appropriate use and maintenance of hand and power tools.

(4) Correct use of equipment and workstations.

b. Personnel conditioning refers to the use of a conditioning or break-in period. New and returning personnel may need gradual integration into a full workload, depending on the job and the person. Supervisors, trained ergonomics personnel, and health care personnel should identify those jobs that require a break-in period. Health care personnel should evaluate those personnel returning from a health-related absence and define the break-in period for each individual person (5 CFR 339.301).

c. Regular monitoring of operations helps to ensure proper work practices and to confirm that the work practices do not contribute to cumulative trauma injury or hazardous risk factors.

d. Effective schedules for facility, equipment, and tool maintenance, adjustments, and modifications will reduce WMSD hazards. This includes ensuring proper working conditions, having sufficient replacement tools to facilitate maintenance, and ensuring effective housekeeping programs. Tool and equipment maintenance may also include vibration monitoring.

C-6. Administrative controls

Use administrative controls to limit the duration, frequency, and severity of exposure to WMSD hazards. Examples of administrative controls include but are not limited to:

a. Decreasing production rate requirements and limiting overtime work to reduce the number of repetitions.

b. Reducing the number and speed of repetitions by reducing line or production speed or by having worker input. Regarding production speed (e.g., using worker-based rather than machine-based production speed).

c. Providing rest breaks to relieve fatigued muscle-tendon groups. Determine the length of the rest break by the effort required, total cycle time, and the muscle-tendon group involved.

d. Increasing the number of personnel assigned to the task (e.g., lifting in teams rather than individually).

e. Instituting job rotation as a preventive measure, with the goal of alleviating physical fatigue and stress to a particular set of muscles and tendons. Do not use job rotation in response to symptoms of cumulative trauma; this can contribute

to symptom development in all personnel involved in the rotation schedule rather than preventing problems. Trained ergonomics and health care personnel should conduct an analysis of the jobs used in the rotation schedule.

f. Providing modified or restricted-duty assignments to allow injured muscle-tendon groups time to rest, assisting in the healing process. Make every effort to provide modified- or restricted-duty assignments when physical limitations (as identified by a health care provider) allow the worker to return to work performing less than his or her normal work requirements. In Regard to modified or restricted-duty assignments:

(1) A health care provider should specifically identify assignments or job tasks for the individual worker based on his or her symptoms, capabilities, and limitations.

(2) Health care providers with specific knowledge in both occupational demands and cumulative trauma injuries should cooperate with trained ergonomics personnel to develop a list of jobs with low WMSD risk.

(3) Civilian personnel representatives and supervisors, in conjunction with health care personnel, should identify modified-duty assignments and tasks and write descriptions for these assignments and tasks that conform to documented requirements. A combination of tasks from one or more jobs can be used as a modified-duty assignment. The description for each modified-duty assignment should include WMSD risk factors and muscle-tendon groups required to perform the job.

C-7. Personal protective equipment

Personal protective equipment (PPE) is not necessarily recommended for controlling exposure to WMSD hazards, since little research has been conducted to support claims of its usefulness.

a. Appliances, such as wrist rests, back belts, back braces, etc., are not considered PPE. Before purchasing such devices, discuss their effectiveness with trained ergonomics personnel. The Office of The Surgeon General does not support the blanket use of back belts as a back injury preventive measure.

b. Consider WMSD hazards when selecting PPE. The PPE:

(1) Should be properly worn or used according to Army and manufacturers' specifications.

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- (2) Should be available in a variety of sizes.
- (3) Should accommodate the physical requirements of personnel and the job.
- (4) Should not contribute to WMSD hazards.

Appendix D

Health Care Management

D-1. Written protocol

Health care personnel will develop a written protocol for the early recognition, evaluation, treatment, and follow-up of WMSDs. This chapter provides the structure and much of the content of this protocol. The protocol includes communication with supervisors and military and civilian personnel to identify worksite problems and implement recommendations. Health care personnel should tailor the protocol to their specific installation and provide it to the ergonomics subcommittee for review.

D-2. Early evaluation of patients

Early recognition and health care management of WMSDs are critical to reduce the impact of injury on both personnel and employer.

a. Common symptoms of WMSDs can include but are not limited to pain, tingling, numbness, stiffness, and weakness in the neck, shoulders, arms, hands, back, and legs. Other symptoms can include headaches, visual fatigue, and increased errors.

b. Soldiers and civilian personnel with symptoms of WMSDs should report to health care personnel for an evaluation.

(1) Active-duty soldiers should report to their primary care provider.

(2) Civilian personnel should report to OH with the appropriate forms: Department of Labor (DOL) Form CA-2 (Notice of Occupational Disease and Claim for Compensation) for all WMSDs except back injuries which require DOL Form CA-1 (Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation) and DOL Form CA-16 (Authorization for Examination And/Or Treatment).

c. Supervisors should ensure that soldiers with WMSD symptoms report for a medical evaluation in a timely manner. Supervisors should encourage civilian personnel to report for a medical evaluation.

d. Supervisors may not place disincentives as an impediment to personnel reporting WMSDs.

D-3. Medical evaluation

The initial medical evaluation of a patient with a possible WMSD should include a detailed medical and occupational history and a physical examination. A standardized questionnaire is a useful tool for obtaining the history (USACHPPM TG 220). Health care personnel, within their approved scope of practice, will:

a. Complete a medical and occupational history that includes:

(1) Military occupational specialty, job title or series, and number of years and months at that job.

(2) Prior work history.

(3) A detailed description of current job tasks and the amount of time normally spent on each task.

(4) A detailed description of symptoms to include location, character (such as burning, sharp, dull, pins and needles), severity, onset, duration, and exacerbating and relieving factors.

(5) Lost time or limited duty due to symptoms.

(6) Prior evaluation, diagnosis, and treatment of symptoms.

(7) Other existing medical conditions and history of trauma and surgery.

(8) Activities and hobbies outside of work.

(9) Current medications.

b. Conduct a physical examination that includes but is not limited to:

(1) Appearance (swelling, muscle atrophy, erythema, ecchymosis).

(2) Range of motion and muscle strength.

(3) Neurological assessment (motor, sensory, reflexes).

(4) Vascular assessment (pulses, capillary refill).

(5) Evaluation for pain and tenderness.

(6) Special tests, such as median nerve percussion (Tinel's sign) and the wrist flexion test (Phalen's test) when appropriate.

c. Perform additional testing as indicated, such as nerve conduction velocities, laboratory tests, and radiographic procedures.

D-4. Treatment

Health care personnel will initiate appropriate treatment and rehabilitation as defined by current standards of medical practice. In general, try conservative therapy before invasive treatment.

a. Supervisors, CPAC, and coworkers will encourage civilian personnel with a suspected WMSD to seek evaluation and treatment in an Army medical treatment facility (MTF) where possible, according to AR 690-800, chapter 810, subchapter 6. Priorities for care and authorization for treatment will be according to AR 40-5, chapter 5, subparagraph 5-10a, and AR 40-3, chapter 2, subparagraph 2-3 and chapter 4, subparagraph 4-20. Occupational health personnel will coordinate with the CPAC and Patient Administration Division when there are questions about a person's entitlement to care.

b. Active-duty soldiers with a suspected WMSD will be seen in an Army Medical Treatment Facility.

D-5. Modified or restricted duty

Health care personnel will coordinate with trained ergonomics personnel to recommend duty assignments that will not aggravate a patient's condition.

D-6. Follow-up

Health care personnel will perform Regular follow-up for patients being treated for WMSDs to monitor the efficacy of therapy and worksite intervention.

D-7. Medical surveillance

a. Work-related musculoskeletal disorders do not require a general screening medical surveillance program. Instead, use the methods of problem identification as described in chapter 4. Health care personnel, in cooperation with members of the ergonomics subcommittee, will--

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(1) Conduct periodic, systematic worksite walk-through surveys to remain knowledgeable about operations and work practices. A minimum of once a year is suggested.

(2) Provide written documentation of the walk-through survey. Documentation should include date, area(s) visited, risk factors identified, actions taken (if any), and any needed prioritized follow-up.

b. Special medical surveillance may be indicated for:

(1) Specific jobs where a high incidence of WMSDs has been demonstrated.

(2) Specific jobs that have been identified as high risk based on systematic active surveillance and detailed analysis.

c. Maintain baseline and periodic health assessment results in personnel medical records. Pay attention to any changes that could indicate a WMSD.

D-8. Reporting

Occupational health, safety, and health care personnel will use the following forms to document WMSDs and perform passive surveillance. These findings will be reported to the ergonomics subcommittee.

a. Log of Federal Occupational Injuries and Illnesses or equivalent.

b. DOL Form CA-2 (all WMSDs except back injuries).

c. DOL Forms CA-1, CA-16, and CA-17 (Duty Status Report) (back injuries).

d. Standard Form 600 (Chronological Record of Medical Care) in the medical record.

e. DA Form 3075 (Occupational Health Daily Log).

f. DA Form 285 and DA Form 285-AB-R for reporting military occupational illnesses according to AR 385-40.

D-9. Worksite evaluation referrals

a. Health care personnel who are treating a patient with a suspected WMSD will request a worksite evaluation for the patient

through the IEO and ergonomics subcommittee. Trained ergonomics personnel, together with health care personnel, should conduct the worksite evaluation.

b. Flow diagrams depicting the handling of traumatic injury and occupational disease and illness are available (USACHPPM TG 220).

Glossary

Section I

Abbreviations

ANSI	American National Standards Institute
AR	Army Regulation
CFR	Code of Federal Regulations
CPAC	Civilian Personnel Advisory Center
CTD	cumulative trauma disorder
DA	Department of the Army
DA PAM	Department of the Army Pamphlet
DOD	Department of Defense
DODI	Department of Defense Instruction
DOL	Department of Labor
DPW	Director of Public Works
EO	Executive Order
FECA	Federal Employee Compensation Act
HHIM	Health Hazard Information Module
HQDA	Headquarters, Department of the Army
IEO	installation ergonomics officer
IH	industrial hygiene
IMA	installation medical authority
MDW	U.S. Army Military District of Washington
MTF	medical treatment facility
NSC	National Safety Council
OH	Occupational health
PL	Public Law
PPE	personal protective equipment
RCS	requirement control symbol
SOH	safety and occupational health
TB MED	technical bulletin, medical
TG	Technical Guide
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USASC	U.S. Army Safety Center
WMSD	work-related musculoskeletal disorder(s)

Section II

Terms

Anthropometry

The study of the physical dimensions of people; including size, breadth, girth, distance between anatomical points, and joint range of motion. This information is used in the design and analysis of workspaces, tools, and equipment.

Cumulative trauma disorders

Disorders of the musculoskeletal or nervous system which are the result of or contributed to by the biomechanical risk factors listed in chapter 2, subparagraph 2-4. The CTDs are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and related bones, muscles, and nerves. Synonymous terms include repetitive motion injury, occupational overuse syndrome, and repetitive strain injury.

Equivalent civilian training

A minimum of 40 hours training covering WMSDs; workstation and job design; hand tool design; current Regulatory requirements and issues; analysis and design of manual material handling tasks; analysis and design of the office environment; and conducting, analyzing, documenting, and presenting an ergonomic worksite evaluation, including hands-on experience.

Ergonomics

A body of knowledge about human abilities, human limitations, and other human characteristics that are relevant to the design of tools, machines, systems, tasks, jobs, and environments for safe, comfortable, and effective human use. The aim of the discipline is to fit the job to the person in order to:

- a. Prevent the development of occupational injury or illness.
- b. Reduce the potential for fatigue, error, or unsafe acts.
- c. Increase effective, efficient work.

Ergonomics expert

An individual who:

- a. Possesses a recognized degree or professional credentials in ergonomics or human factors engineering (typically a master's or doctorate degree).
- b. Demonstrates the ability to identify and correct WMSDs in the workplace.
- c. Teaches the 40-hour ergonomics course for trained ergonomics personnel.
- d. Provides consultation only in cases in which trained ergonomics personnel are unable to solve identified problems. In most cases, an ergonomics expert will not be available at each installation.

Ergonomics team

Those responsible for identifying and correcting occupational hazards in the workplace including trained ergonomics personnel, health care providers, industrial hygienists, safety personnel, engineers, and other support personnel, managers, and supervisors.

Health care personnel

Physicians, chiropractic physicians, nurses, occupational therapists, physical therapists, physician assistants, and other health care professionals and supervised technicians (such as certified occupational therapy assistants and licensed practical nurses). Health care personnel participating in the ergonomics program should have training in basic ergonomics and epidemiology and be up-to-date in the systematic recognition, evaluation, treatment, and rehabilitation of WMSDs.

Microtrauma

A series of minor stresses to the body, each of which alone does not cause discernible damage; however, their accumulation over time can lead to WMSDs. These disorders (injuries or syndromes) are also known as CTDs, overuse disorders, repetitive motion injuries, repetitive strain injuries, and occupational motion-related injuries.

Multiple causation

The combined effect of several risk factors in one job, operation, or workstation that may increase the possibility of WMSDs.

Occupational hazards

Workplace conditions that may harm the worker: improperly designed workstations; tools and equipment; improper work methods; and excessive tool or equipment vibration. Other examples include aspects of work flow, line speed, posture, force required, work and rest Regimens, and repetition rates.

Occupational illness and injury

a. To be recorded as an occupational illness or injury, the condition must be diagnosed by a physician, Registered nurse, or other person who, by training or experience, is capable of making such a determination (e.g., an occupational therapist, physical therapist, or physician assistant).

b. To be classified as an occupational illness or injury the condition must meet the following criteria:

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(1) Either physical findings or subjective symptoms must exist, i.e., at least one physical finding (e.g., positive Tinel's, Phalen's, or Finkelstein's test; swelling, redness, or deformity; or loss of motion or strength) or at least one subjective symptom (e.g., pain, numbness, tingling, aching, stiffness, or burning).

(2) At least one of the following response actions must occur: medical treatment (including self-administered treatment if made available to personnel by their employer), lost or restricted work activity, or transfer or rotation to another job.

(3) Cumulative trauma disorders must be associated with repeated trauma, and exposure at work must have caused or contributed to the onset of symptoms or aggravated existing symptoms.

Pinch grip

A grip that involves one or more fingers and the thumb.

Rate

a. Incidence (new case) rate (per 100 worker-years per year):

$$\frac{\text{Number of new cases during the past 12 months} \times 200,000 \text{ hours}}{\text{Number of work hours during the past 12 months}}$$

b. Severity (lost workdays) rate (per 100 worker-years per year):

$$\frac{\text{Number of lost workdays during the past 12 months} \times 200,000 \text{ hours}}{\text{Number of work hours during the past 12 months}}$$

c. Prevalence (all cases during period) rate (per 100 worker-years per year):

$$\frac{\text{Total number of cases in the past 12 months} \times 200,000 \text{ hours}}{\text{Number of work hours during the past 12 months}}$$

(1) Use incidence rates if possible, since the incidence rate measures new cases occurring over a period of time, while prevalence rates give a "snapshot" picture of the number of individuals affected at a specific point in time. Incidence rate and severity rate allow monitoring of changes over time, rather than recounting chronic problems throughout the duration of the illness or injury.

(2) Consistency in reporting is important; therefore, one should use either incidence, severity, or prevalence rates for purposes of comparison.

(3) If the specific number of work hours during the past 12 months is not available, multiply the number of full-time equivalent employees in each area by 2,000 hours to obtain the denominator.

Trained ergonomics personnel

Health care, industrial hygiene, environmental science, safety, or engineering personnel with approved training in ergonomics. Minimum acceptable training for installation-level trained ergonomics personnel is the basic 40-hour ergonomics course offered by USACHPPM or equivalent civilian training.

Working community

All members of the work environment, at all levels of authority. It consists of major command commanders, installation commanders, the IMA, the designated IEO, identified ergonomics personnel, health care personnel, safety personnel, the CPO, contracting support, DPW, logistics, union representatives, unit commanders, supervisors, and active duty military and civilian personnel. For the program to be successful, all members of the working community must be considered equal and must share the commitment to ergonomics.

Work-related musculoskeletal disorders

a. The range of health problems arising from repeated stress to the body encountered in the workplace. These health problems may also affect the nervous and neurovascular systems and may include the various occupationally induced CTDs, cumulative stress injuries, and repetitive motion disorders.

b. Damage to tendons, tendon sheaths, synovial lubrication of the tendon sheaths, bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck, back, and legs. Some WMSDs that are reported include chronic back pain, carpal tunnel syndrome, DeQuervains disease, epicondylitis (tennis elbow), Raynaud's syndrome (white finger), synovitis, tenosynovitis, stenosing tenosynovitis crepitans (trigger finger), and tendinitis.

Worksite

A work area or work environment.

Workstation

An individual person's work area, such as a desk, chair, and computer terminal or an individual inspection station.